Joint Trauma System

Defense Health Agency

Pain, Anxiety and Delirium

Part of the Joint Trauma System (JTS) Clinical Practice Guideline (CPG) Training Series

Purpose

This CPG provides evidence-based guidelines for the management of pain, anxiety, and delirium (PAD) in military trauma patients.

This presentation is based on the ***Pain, Anxiety, and Delirium CPG, 13 Mar 2017 (ID:29).*** *It is a high-level review. Please refer to the complete CPG for detailed instructions. Information contained in this presentation is only a guideline and not a substitute for clinical judgement.*

Agenda

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Summary

- Aggressive treatment of pain, anxiety, and delirium is an essential part of care throughout the continuum of care.
- Evaluation should use standardized methods.
- Treatment includes both non-pharmacologic and pharmacologic methods.

Background

- Pain is universally present in combat casualties. Treatment should begin at point of injury through all echelons of care.
  - Moral, medical, and operational imperative to treat.
  - Treatment reduces incidence of chronic pain syndromes, post traumatic stress disorder, and long-term narcotic dependency.
  - Pain control should be optimized as a priority over sedation.
  - A multimodal approach is advised to reduce negative side effects.
- All members of the care team should work as a team to provide effective pain management.

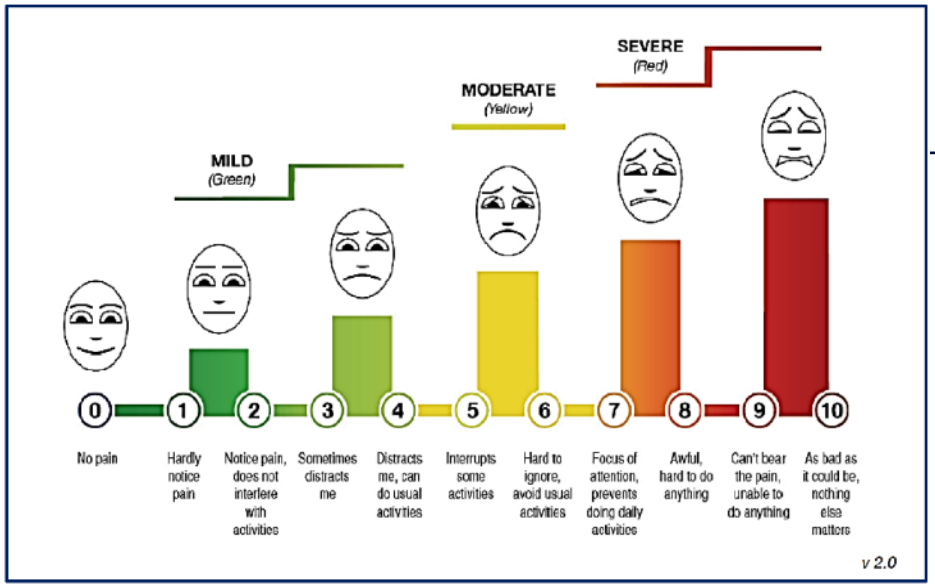
Goals & Staffing

- Pain control starts at point of injury, but limits in staffing make a pain management team most feasible at a Role 3 and above.
  - ❑ Establish an Acute Pain Service when able, to include at least:
    - Physician most experienced in pain management (often anesthesiologist) as Pain Consultant
    - Chief Pain Nurse
    - Ward Pain Nurse Champions
  - ❑ Team should interact directly and frequently with primary treating service.
  - ❑ Team should be available to all patients admitted to the hospital.
- Primary mission is the provision of effective pain control as well as the treatment and prevention of anxiety and delirium.

Evaluation: Scoring Pain

- Pain, agitation, and delirium should be measured and treated based on accepted scoring systems.
  - DoD/VA Pain Rating Scale (DVPRS): Used to assess pain.
  - Richmond Agitation Sedation Scale (RASS): Used to assess anxiety.
  - Confusion Assessment Method (CAM): Used to assess presence of delirium.
- Always document treatments.
- Materials to allow for regional anesthesia or systemic medications should be readily available.

DoD/VA Pain Rating Scale



1. Circle the one number that describes how, during the past 24 hours, pain has interfered with your usual ACTIVITY:

0 — 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8 — 9 — 10

Does not interfere — Completely interferes

2. Circle the one number that describes how, during the past 24 hours, pain has interfered with your SLEEP:

0 — 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8 — 9 — 10

Does not interfere — Completely interferes

3. Circle the one number that describes how, during the past 24 hours, pain has affected your MOOD:

0 — 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8 — 9 — 10

Does not affect — Completely affects

4. Circle the one number that describes how, during the past 24 hours, pain has contributed to your STRESS:

0 — 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8 — 9 — 10

Does not contribute — Contributes a great deal

*Reference for pain interference: Cleeland CS, Ryan KM. Pain assessment: global use of the Brief Pain Inventory. Ann Acad Med Singapore 23(2): 129-138, 1994.

v 2.0

Richmond Agitation Sedation Scale

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Score	Term	Description	
+4	Combative	Overtly combative, violent, immediate danger to staff.	
+3	Very Agitated	Pulls or removes tube(s) or catheter(s); aggressive.	
+2	Agitated	Frequent non-purposeful movement, fights ventilator.	
+1	Restless	Anxious but movements not aggressive vigorous.	
0	Alert, Calm		
-1	Drowsy	Not fully alert, but has sustained awakening (eye-opening/eye contact) to voice (>10 seconds).	Verbal Stimulation
-2	Light Sedation	Briefly awakens with eye contact to voice (< 10 seconds).	
-3	Moderate Sedation	Movement or eye opening to voice (but no eye contact).	
-4	Deep Sedation	No response to voice, but movement or eye opening to physical stimulation.	Physical Stimulation
-5	Unarousable	No response to voice or physical stimulation.	

Procedure for RASS Assessment	
1. Observe patient: Patient is alert, restless, or agitated.	Score 0 to +4
2. If not alert, state patient's name and say to open eyes and look at speaker	
- Patient awakens with sustained eye opening and eye contact.	Score -1
- Patient awakens with eye opening and eye contact, but not sustained.	Score -2
- Patient has any movement in response to voice but no eye contact.	Score -3
3. When no response to verbal stimulation, physically stimulate patient by shaking shoulder and/or rubbing sternum.	
- Patient has any movement to physical stimulation.	Score -4
- Patient has no response to any stimulation.	Score -5

*Sessler CN, Gosnell M. Grap MJ, Brophy GT, O'Neal PV, Keane KA et al. The Richmond Agitation-Sedation Scale: validity and reliability in adult intensive care patients. Am J Respir Crit Care Med 2002; 166:1338-1344.
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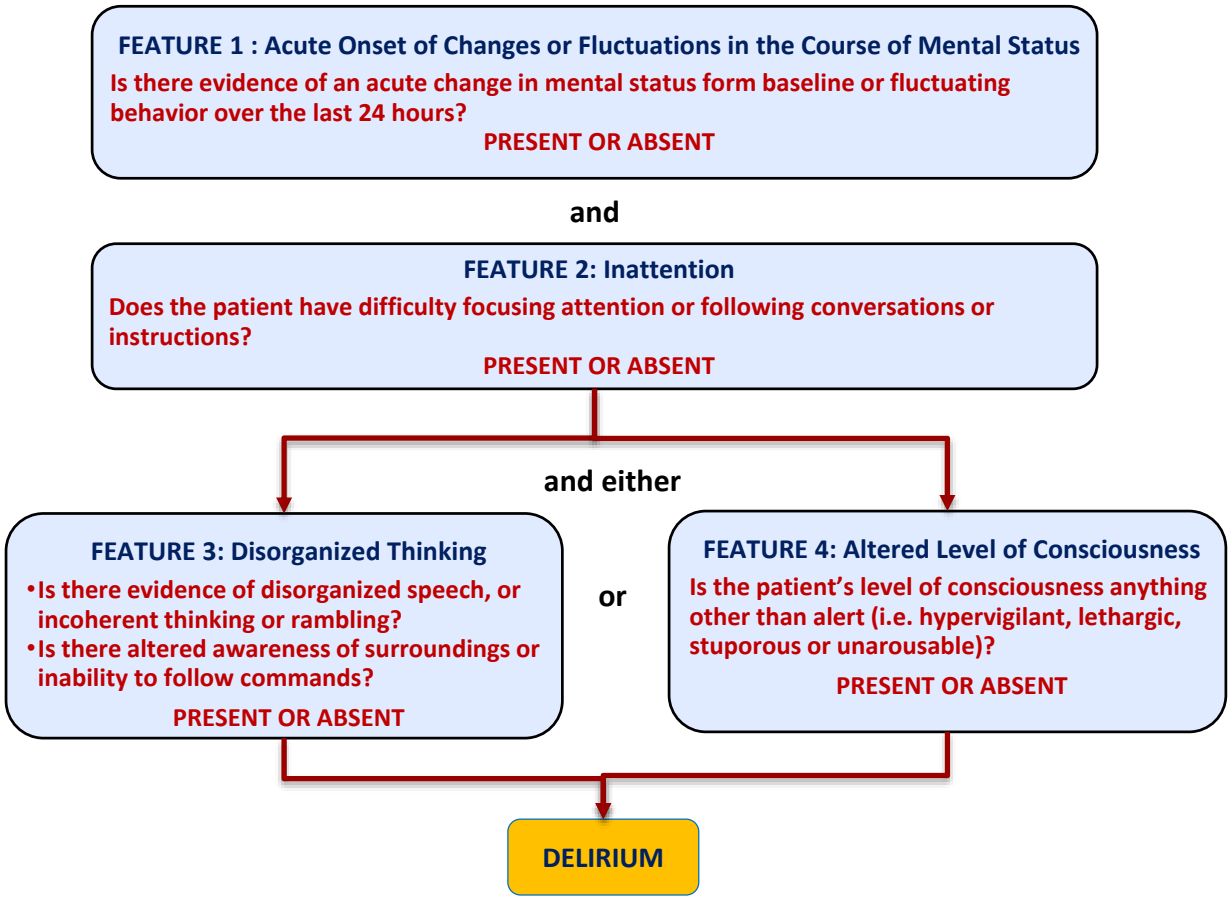
Confusion Assessment Method



Pain Medication Treatment

- Medications should be specifically directed and dosed to achieve a desired goal such as:
  - Achieve a pain score of 4 or less.
  - Maintain sufficient patient consciousness to assess the evolution of injuries by physical exam.
  - Decrease the need for mechanical ventilation.
  - Ameliorate the symptoms of anxiety, delirium or agitation.

Preventive Measures

- Pain, as a product of trauma, cannot be prevented. Early intervention can prevent the psychological and biochemical consequences of pain.
- Prevention of anxiety and delirium begins with recognition that all patients are at risk.
  - Management of underlying etiologies including pain, hypoxia, metabolic abnormalities, etc., is essential.
  - Disorientation from sedation can be mitigated with frequent/systematic reorientation and maintenance of sleep patterns.

Preventive Measures

- Additional preventative measures include:
  - Providing hearing aids or eye glasses as needed to prevent sensory deprivation.
  - Intubated patients should receive spontaneous breathing trials daily.
  - Physical and occupational therapy should be started as soon as possible.
  - Avoid prophylactic administration of antipsychotics and benzodiazepines. (Consider Propofol for short term sedation.)

Pain Evaluation

Some level of pain is present in all combat casualties.

- Assess as early as possible and repeatedly thereafter.
  - Assess at least 1-4 hours for non-intubated patients using DVPRS.
  - Assess continuously for intubated patients.
- Document pain scores.

Pain Control

Signs of inadequate pain control include tachycardia, hypertension, and agitation.

- Life- and limb-threatening injuries can also have similar systemic effects and include:
  - Compartment syndrome
  - Missed injuries
  - Impending physiologic decline
- Exclude other injuries before attributing physical exam findings to pain.

Pain Pharmacology

Primary pharmacologic treatments include ketamine and opiates.

- Ketamine is a very effective analgesic alone or in association with opiates.
  Parental doses of 0.15 – 0.3 mg/kg shown to reduce pain, total narcotic use, and need for rescue medications.
- Any opioid medication can be titrated to the equal effectiveness of another opiate to achieve desired pain control.

Role 1 Evaluation & Treatment

Role 1 has limited resources and supplies. Options include:

- Patient able to fight (mild to moderate pain): Combat pill pack which contains acetaminophen and meloxicam.
- Patient **not** in or likely to develop shock or respiratory distress (moderate to severe pain): Oral transmucosal fentanyl citrate 800 ug.
- Patient in or likely to develop shock or respiratory distress: Ketamine 50 mg IM/IN or 20 mg IV or IO with repeated doses every 20-30 minutes depending on route.

Role 2 Evaluation & Treatment

At Role 2, an anesthesiologist or nurse anesthetist will be on staff and will be responsible for perioperative pain management.

- May have regional blocks or patient-controlled analgesia (PCA) pumps.
- Opiates and ketamine titrated to effect with benzodiazepines for dysphoric symptoms associated with ketamine.

Role 3 Evaluation & Treatment

At Role 3 or above, more robust options available including:

- Continuous or single-injection epidural and peripheral nerve catheter infusions.
- Low-dose ketamine infusions.
- Fentanyl, hydromorphone, and morphine PCAs.

Use of Catheters (1)

- Epidural and regional catheters should be used with some caution.
  - All catheters should receive a 3 mL test dose of local anesthetic and 1:400,000 epinephrine.
  - Low molecular weight heparin (LMWH) use should be timed to be given at least 12 hours before insertion and 2 hours after removal.
  - LMWH should not be used in aeromedical evacuation (AE) patients with epidural catheters.
  - Be mindful of total anesthetic doses and do not exceed safe limits (i.e., total dose of 0.2% Ropivicaine should not exceed 20 mL/hr).
  - Blocks may mask compartment syndrome, and patients at risk should be closely monitored.

Use of Catheters (2)

- Local anesthetic toxicity can happen in patients with pain control catheters.
  - ❑ Symptoms include: tinnitus, anxiety, restlessness, dizziness, blurred vision.
  - ❑ If toxicity is suspected, stop all local anesthetics.
- Can present with cardiac arrest; if so, stop local anesthetics and:
  1. Start advanced cardia life support.
  2. Patient should immediately receive 1.5 mL/kg of 20% intralipid repeated 1-2 times for persistent asystole, pulseless electrical activity, or reemergence of arrest.
  3. If hemodynamic instability persists or recurs, set intralipid infusion rate to 0.5 mL/kg/min for at least 10 minutes after stability restored.
- Can present with seizure; if so, stop local anesthetics and:
  1. Treat seizure with anti-seizure medication.
  2. Control airway if needed.

Anxiety, Delirium

- Altered mental status can be expected and preemptively managed.
- Evaluation and treatment can be complicated by the presence of traumatic brain injury (TBI).
  - TBI can impede accurate assessment.
  - Moderate to severe TBI is high risk for atypical or paradoxical reactions to sedating and stimulating agents.
  - Reactions to individual agents can change drastically over a short period of time as TBI evolves.

Anxiety Treatment

- Propofol is a good option for short-term sedation in patients with normal hemodynamics.
  - Propofol can cause hypotension.
  - Propofol should only be administered in patients who have a definitive airway and under continuous monitoring.
  - Rapid onset and clearance.
- Dexedetomidine is an option for patients on non-invasive mechanical ventilation for short-term sedation and anxiolysis.
  - Mild analgesic effects
  - Caution when used in patients with bradycardia or heart block
- Clonidine is useful for mild sedation and analgesia particularly in patients with hypertension with agitation.

Delirium Treatment

Haloperidol (Haldol) and quetiapine (Seroquel) are commonly used for treatment of delirium.

- Both increase QT interval and the cardiac effect should be monitored on a daily bases with EKG.
- Medications should be discontinued if QTc exceeds 500 msec or the interval increases 60 msec from baseline.
- Quetiapine also effective as an anxiolytic and to regulate sleep when used before bed.

Analgesics & Anxiolytics

Use of Analgesics and Anxiolytics with Mechanical Ventilation

- Intermittent dosing of analgesics and anxiolytics has benefits over continuous dosing and should be used first if possible.
  - Reduces duration of mechanical ventilation.
  - Continuous infusion will often result in a prolonged duration of action/effect due to accumulation of metabolites.
  - Patients requiring dosing more frequently than every 1-2 hours, continuous dosing can be titrated to effect.

Analgesics & Anxiolytics

Use of Analgesics and Anxiolytics with Mechanical Ventilation

- Daily interruptions of sedation (sedation vacations) have demonstrated reduction in duration of mechanical ventilation and ventilator-associated pneumonia.
  - To perform, continuous infusions should be stopped daily to assess physical examination and perform spontaneous breathing trial.
  - Sedation goals can be assessed after sedation holidays.
- Contraindications to sedation vacation:
  - Intractable intracranial hypertension.
  - Hemodynamic instability.
  - Inability to adequately oxygenate or ventilate the patient.

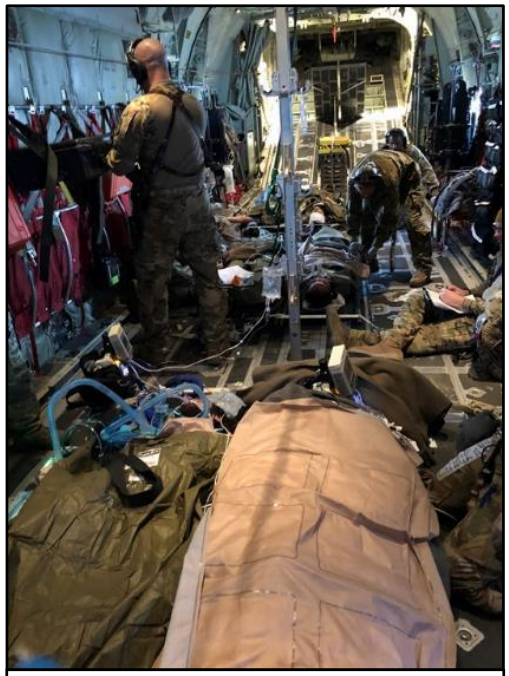
Special Considerations

- Nausea is a common side affect of trauma and of medications used to treat pain, anxiety and delirium.
  - Gastric decompression with a nasogastric tube if any type of obstruction or gastric distension suspected.
  - Ondansetron is pharmacologic therapy of choice.
- Pain control may mask compartment syndrome.
  In patients at risk for compartment syndrome:
  - Any patient at risk for compartment syndrome with increasing pain medication requirements needs aggressive evaluation.
  - Fasciotomies or compartment checks should be done if there are any clinical findings for compartment syndrome or if patient is unable to reliably detect/report pain yet clinical findings raise concern.

AE Special Considerations

AE requires preparation.

- Patient movement requests must state type of regional anesthesia.
- All equipment and therapies used in flight must be approved for flight and personnel trained in their use.
- Ambit pumps currently approved.
- No narcotics should be added to infusions.



Aeromedical transportation of patients

AE Considerations

Patients undergoing prolonged air evacuation are exposed to a multitude of environments in an austere setting.

- Turbulence, weather, temperature, limited patient access, and monitoring make it difficult to maintain sedation and anesthesia.
- May be necessary to empirically increase sedation and pain regimens to maintain safety margin to prevent accidental dislodgement of critical items such as endotracheal tubes.
- Increased medications cloud neurologic examinations, so patients requiring neurologic monitoring in flight should have intracranial pressure monitors.

PI Monitoring

- **Intent (Expected Outcomes)**
  - All combat casualties will have their pain needs addressed.
  - All combat casualties in the ICU will be assessed for pain using a validated pain scale and sedation using a validated sedation scale and will have the goals for pain and sedation documented.
- **Performance/Adherence Measures**
  - All combat casualties will have a pain score recorded upon admission to a Role 3 facility and as part of routine care while in the intensive care unit.
  - No combat casualties will experience an inadvertent or unplanned extubation.
  - All combat casualties in intensive care unit will be screened for delirium daily.
- **Data Source**
  - Patient Record
  - Department of Defense Trauma Registry (DoDTR)

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Appendices

- **Appendix A**: Pain, Anxiety (Sedation) and Delirium Guidelines
- **Appendix B**: DOD and VA Pain Rating Scale
- **Appendix C**: DOD and Veterans Pain Supplemental Questions
- **Appendix D**: Richmond Agitation Sedation Scale (RASS)
- **Appendix E**: The Confusion Assessment Method (CAM)
- **Appendix F**: Regional Anesthetic Use
- **Appendix G**: Sedation Orders
- **Appendix H**: Additional Information Regarding Off-Label Uses in CPGs

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